

REMARKS

In view of the preceding amendments and the comments which follow, and pursuant to 37 C.F.R. § 1.111, amendment and reconsideration of the Office Action of September 9, 2004 is respectfully requested by Applicant.

Summary

Claims 1, 5, 6, and 10 – 14 stand rejected. Claims 1, 5, 6, and 10 – 14 are amended. No new matter has been introduced as a result of these amendments. Claims 1, 5, 6, and 10 – 14 are pending following consideration and entry of the present amendments and remarks.

Rejection under 35 U.S.C. § 103

The Examiner has rejected Claim 1, 5, 6, and 10 – 14 under 35 U.S.C. § 102 (e) as being unpatentable over Levin et al. (US Patent 6,154,210). The amended Claim 1 is directed to an input unit provided with a manual manipulator, position sensors, actuators, and a control section for controlling the actuators.

Amended Claim 1 recites that “the control section computes an initial width of the movable range of the manual manipulator from a current position to an end of its possible motion according to changes in position signals supplied from the position sensors.” Claim 1 now further recites that “the control section controls the output to the actuators as a resistance is weakened when the computed initial width of the movable range is wide, and the control section controls the output to the actuator as a resistance is increased when the computed initial width of the movable range is narrow.”

Thus, the configuration of Claim 1 enables the controlled output to the actuators to correspond to the computed initial width of the movable range of the manipulator. Hence, once computed on the basis of the initial width of the movable range, the output to the actuator is applied to the manual manipulator from the current position to an end of the manual manipulator possible motion based on position signals supplied from the position sensors. This feature is not disclosed or suggested by Levin et al.

Although, the Examiner indicates that in the Levin's reference the output to the actuators is controlled according to the computed initial width of the

movable range of the manipulator, namely in column 10, lines 8 - 30, Applicant respectfully disagrees. The section of Levin et al. relied on by the Examiner recites that "A basic force sensation is force detents that are output at particular rotational positions of the knob to inform the user how much the knob has rotated and/or to designate a particular position of the knob. The force detents can be simple jolts or bump forces to indicate the detents position, or the detents can include forces that attract the knob to the particular rotational detent position and resist movement of the knob away from that position." Thus, these force sensations that Levin et al. disclose as defined by jolts, bumps and attraction or repulsion forces are not outputs to the actuators that are computed on the basis of the corresponding initial width of the movable range of the manual manipulator as provided by the position sensors. Specifically, Levin et al do not teach or suggest that the initial width of the movable range is computed from the current position of the manual manipulator to an end of its possible motion, and that the output to the actuators is controlled according to the computed initial width of the movable range.

In addition, in the configuration of Claim 1, the controlled output to the actuators is weakened when the computed initial width of the movable range of the manual manipulator from its current position to an end of its possible motion is wide or, conversely, is increased when the movable range is narrow (see page 8, lines 22 – 27). This feature is not disclosed or suggested by Levin et al.

In regard to this feature, the Examiner pointed out, in reference to pre-amendment rejections of Claims 11 and 12, that the Levin's reference also discloses that a damping force sensation can also be provided on to the knob (manual manipulator) to slow down the rotation of the manual manipulator, allowing more accurate control by the user (see column 10, lines 62 – 64). As such, the disclosed damping force is configured to slow down the manipulator rotation independently of the initial width of the movable range. Therefore, Levin et al do not teach or suggest that the damping force is computed based on the initial width of the movable range.

This distinguishable feature also minimizes a risk that a user over- operates the manual manipulator, such as striking the manipulator against a

stopper. In contrast as illustrated in the explanation sheet, the Levin's reference is silent about the controlled output being adjusted (increased or weakened) based on the initial width of the movable range.

Further, Levin et al also disclose, in the same column 10, lines 55 – 62, that the force sensation outputted on a manipulator is a spring force, which can provide resistance to rotational movement of the knob in either direction to simulate a physical spring on the manipulator. In regard to the simulated spring force, Applicant submits that the resulting force typically increases continuously in resistance while the manipulator is rotated in either direction from a natural state of the corresponding spring. Thus, when the spring force is simulated on the manipulator, the resulting spring force resistance changes as the manipulator is rotated. In contrast, Applicant's controlled computed output corresponds to the computed initial width of the movable range based on the current position to the end of possible motion. Thus, once computed based on the initial width of movable range (travel), the controlled output is applied to the manual manipulator for substantially the initial width of the movable range.

The Examiner has also indicated that the arrangement of Claim 1 was identical to one "detent" feature disclosed in the Levin's reference. Applicant respectfully disagrees. In Levin, the detent is configured to be dependent on the current position of the manual manipulator. In contrast, the claimed feature is configured to be dependent on the initial width of the movable range of the manual manipulator.

Hence, based on the above discussions, Applicant submits that Claim 1 is patentable over Levin et al.

Regarding the rejection of Claim 5, the amended Claim 5 recites an additional limitation, namely that of electric devices operated by the manual manipulator. As such, Claim 5 now recites that "the control section computes an initial width of the movable range of the electric devices from its current position to an end of its possible motion according to changes in position signals supplied from the position sensors." Thus, the configuration of claim 5 also enables the output to the actuators to correspond to the computed initial

width of the movable range of the electric devices. This feature is also not disclosed or suggested by Levin et al. Since the rejections of Claim 5 are similar to Claim 1, Applicant submits that the above remarks distinguishing Claim 1 from the Levin's reference are also applicable to Claim 5. As such, claim 5 is patentable over Levin et al.

Therefore, Applicant submits that Claims 1 and 5 are allowable, as well as their correspondingly dependent claims 6, and 10 - 14. Thus, Applicant earnestly requests that the rejections of claims 1, 5, 6, and 10 - 14 under 35 U.S.C. §103(a) be withdrawn.

Conclusion

Applicant submits that this application is now in condition for allowance, and favorable reconsideration of this application in view of the above amendments and remarks is respectfully requested. If, there are additional fees due, Applicant requests that this paper constitutes any necessary petition and authorizes the Commissioner to charge any underpayment, or credit any overpayment, to Deposit Account No. 23-1925. If the examiner finds that there are any outstanding issues which may be resolved by a telephone interview, the Examiner is invited to contact the undersigned at the below listed number

Respectfully submitted,
Brinks, Hofer, Gilson & Lione

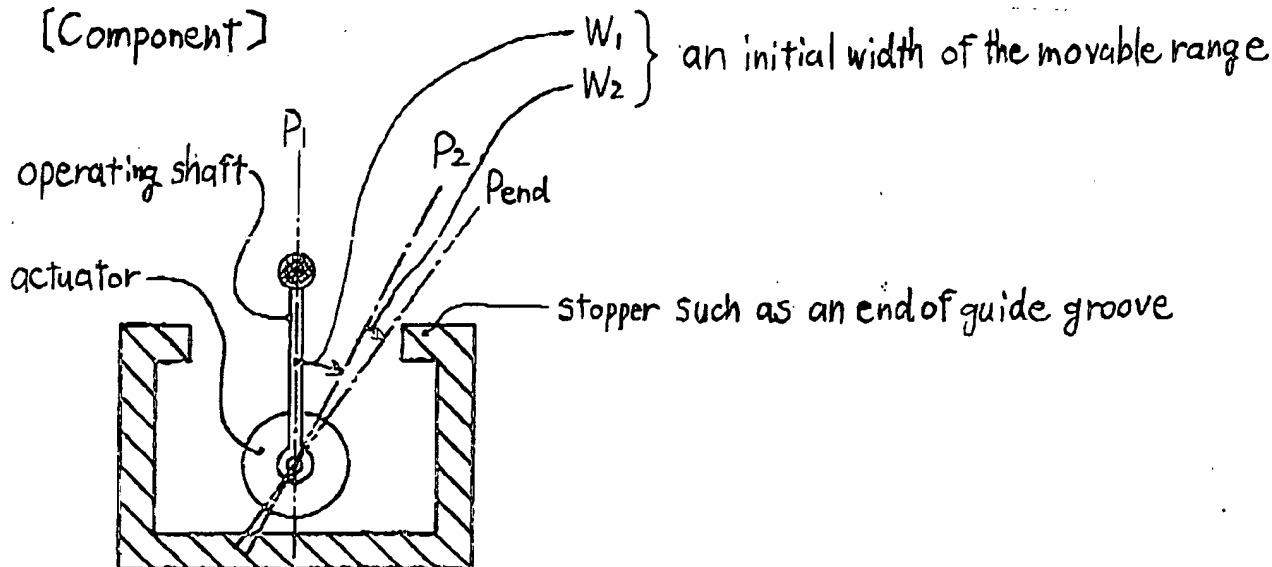
By 

Gustavo Siller, Jr.
Registration No.: 32,305
Attorney for Applicant

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

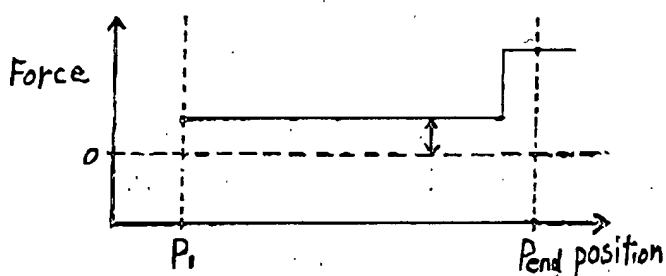
Explanation sheet

[Component]

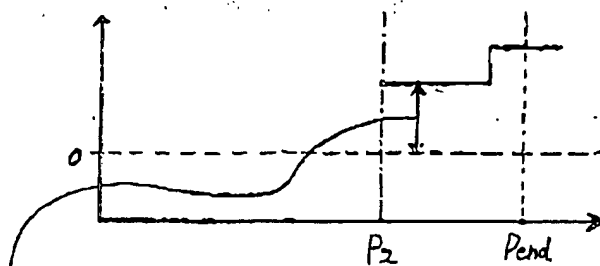


[Invention]

When an initial position of the shaft is P_1 ,
(when an initial width of the movable range is wide)



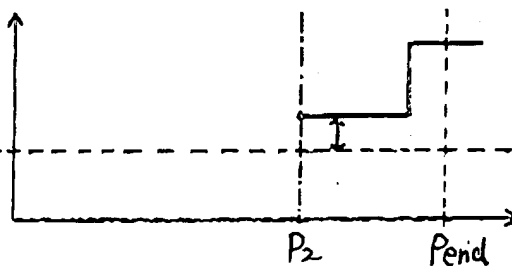
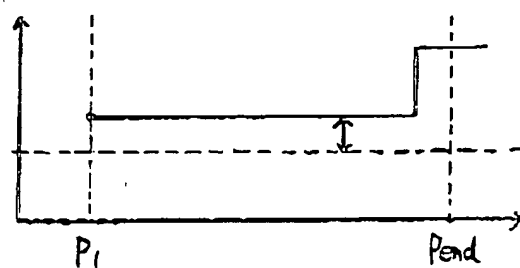
When an initial position of the shaft is P_2 ,
(when an initial width of the movable range is narrow)



feature: a resistance is emphasized

effect: being able to prevent over-operating
such as strike against the stopper

[Prior art or Levin]



BEST AVAILABLE COPY